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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/731,266 | 12/09/2003 | Motoyoshi Sekiya | FUJZ 20.770 | 4696 |

26304 7590 11/29/2006

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| EXAMINER | |
|---|---|
| JEAN BART, RALPH | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2613 | |

DATE MAILED: 11/29/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/731,266 | SEKIYA ET AL. | |
| | Examiner | Art Unit | |
| | Ralph Jean-Bart | 2613 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) 1-11 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-11 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date 12/09/2003.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1,2,3 are rejected under 35 U.S.C. 102(e) as being anticipated by Zarris et al (Pub. No.:US 20002/0135842).

3. With respect to claim 1, Zarris teaches a drop portion for dropping an optical signal (see figure 3 optical tape coupler 14 which represents the drop portion); a monitor for monitoring a spectrum of the dropped optical signal within a modulation band per channel (see figure 3 elements 12 and 16); a controller for detecting non-flatness of a pass characteristic of a transmission line from the spectrum (see figure 3 elements 18, 20, and 22 which determine the non-flatness); and a compensator for compensating the non-flatness for the optical signal (see figure 3 element 26).

4. With respect to claim 2, Zarris teaches the compensator is provided on a reception side or a transmission side of the optical signal (see figure 1 element 10, which represents the compensator and places on the left most side of transmitter 2, and the right most side of receiver 4).

5. With respect to claim 3, Zarris teaches the monitor comprises an optical spectrum analyzer (see figure 3 Equalization elements 26 which the examiner interprets as a spectrum analyzer), and the controller detects the non-flatness by determining a linear gradient of a spectrum around a peak wavelength, determined by sweeping the optical spectrum analyzer (see figure 2; paragraph 0026).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

7. Claim 4, 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarris et al (Pub.No.: US 2002/0135842) in view of Kinoshita et al (US 6,282,017).

With respect to claim 4, all the limitations of this claim have been discussed in claim 1 above. Zarris fails to teach a coupler for further dropping the optical signal from the drop portion, two tunable filters for sweeping the optical signal from the coupler and for respectively extracting an optical signal component a fixed wavelength width apart around a peak wavelength, and two photo diodes for detecting power of an output optical signal of the tunable filters to be provided to the controller.

However, Kinoshita teaches a coupler for further dropping the optical signal from the drop portion (see figures 14 and 15 element optical coupler 168), two tunable filters for sweeping the optical signal from the coupler and for respectively extracting an optical signal component a fixed wavelength width apart around a peak wavelength (see figures 14 and 15 elements filter 170 and 172), and two photo diodes for detecting power of an output optical signal of the tunable filters to be provided to the controller (see figures 14 and 15 elements photo-diode 178 and 180 and elements I/V converter 178 and 180 which the examiner interprets as the output power of the photo-detector).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Gain Shape Compensation of Zarris by incorporating a coupler for further dropping the optical signal from the drop portion, two tunable filters for sweeping the optical signal from the coupler and for respectively extracting an optical signal component a fixed wavelength width apart around a peak wavelength, and two photo diodes for detecting power of an output optical signal of the tunable filters to be provided to the controller.

The motivation for this modification in Zarris is to provide an optical communication system which can easily respond to a change in the number of channels in WDM, and, further to provide an optical amplifier which can maintain a constant gain tilt and allows automatic level control as taught by Kinoshita (see Kinoshita column 2 lines 5-12).

8. With respect to claim 5, Zarris teaches a modulator, on a transmission side, for applying to the optical signal an intensity modulation of a predetermined frequency for monitoring (it is inherent that a modulator is placed on the transmission side see figure 1 and figure 2 shows a modulation depth), the filters being set to extract an optical signal component the fixed wavelength width corresponding to the predetermined frequency apart from the peak wavelength (see paragraph 0026).

9. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zarris et al (Pub.No.: US 2002/0135842), and Kinoshita (US 6,282,017) as applied to claim 4 above, and further in view of Watanabe (US 5,896,211).

10. With respect to claim 8, all the limitations of this claim have been discussed in claim 4 above. Zarris and Kinoshita fail to teach a comparator for detecting an output level difference between the photo diodes, and the controller controls the compensator so that an output level of the comparator assumes zero.

However, Watanabe teaches a comparator for detecting an output level difference between the photo diodes (see figure 18 Comparator element 136), and the controller controls the compensator so that an output level of the comparator assumes zero (see column 14 lines 12-21).

11. Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Gain Shape Compensator of Zarris, and the Optical Amplifier of Kinoshita by incorporating a comparator for detecting an output level difference between the

photo diodes, and the controller controls the compensator so that an output level of the comparator assumes zero in order to provide an optical communication system which permits large capacity frequency division multiplexed optical transmission to be implemented easily and at low cost and a number of channel to be received simultaneously by a single receiver as taught by Watanabe (see Watanabe column 3 lines 15-19).

12. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Zarris et al (Pub. No.: US 2002/0135842) in view of Uehara (US 6,335,810).

13. With respect to claim 9, all the limitations of this claim have been discussed in claim 2 above. Kinoshita fails to teach the reception side comprises an arbitrary intermediate node.

However, Uehara teaches the reception side comprises an arbitrary intermediate node (see figure 3 element ADM Node $\lambda_n$ which the examiner interprets as an arbitrary intermediate node).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Gain Shape Compensator of Zarris by incorporating on the reception side an arbitrary intermediate node in order to achieve the effective use of transmission paths and the flexibility.

The motivation for this modification in Zarris is to provide an optical add/drop node capable of implementing a WDM optical transmission in which a monitor is used in

carrying control information for a main signal component or channel as taught by Uehara (see Uehara column 1 line 50-55).

14. Claims 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarris et al (Pub. No.: US 2002/0135842) in view of Watanabe (US 5,896,211).

15. With respect to claim 6, all the limitations of this claim have been discussed in claim 1 above. Zarris fails to teach a modulator, on a transmission side, for applying to the optical signal an intensity modulation of a predetermined frequency for monitoring, a laser diode connected to the drop portion to perform a heterodyne detection, the monitor being composed of a photo diode for inputting an optical signal, from the drop portion, of a wavelength detected by a heterodyne detection, an electric spectrum analyzer for determining powers of at least two electric signals a fixed frequency width apart around a peak frequency determined by sweeping an electric signal outputted from the photo diode, to be provided to the controller.

However, Watanabe teaches a modulator, on a transmission side, for applying to the optical signal an intensity modulation of a predetermined frequency for monitoring (see figure 5 element optical modulator 43), a laser diode connected to the drop portion to perform a heterodyne detection (see figure 5 element local light source 45 and optical mixer 46), the monitor being composed of a photo diode for inputting an optical signal, from the drop portion, of a wavelength detected by a heterodyne detection (see figure 5 element optical detector 48), at least two electric signals a fixed frequency width apart around a peak frequency determined by sweeping an electric signal outputted from the

photo diode, to be provided to the controller (see figure 5 elements electric bandpass filter 50-1 to 50-K).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Gain Shape Compensation of Zarris by incorporating a modulator, on a transmission side in order to reduce the output power, a laser diode connected to the drop portion to perform a heterodyne detection in order to provide a high reception sensitivity, a monitor being composed of a photo diode for inputting an optical signal, from the drop portion, of a wavelength detected by a heterodyne detection in order to carry out optical heterodyne detection of the of the mixed optical signal, and further to detect electrical beat signal.

The motivation for this modification in Zarris is to provide an optical communication system, which permits SCM optical communication by coherent optical transmission to be implemented at lower cost as taught by Watanabe (see Watanabe column 3 lines 20-23).

16. With respect to claim 7, all the limitations of this claim have been discussed in claim 6 above. Zarris fails to teach two electric filters for respectively extracting an electric signal component a fixed frequency width apart around a peak frequency determined by sweeping an electric signal outputted from the photo diode, and two wattmeters for determining powers of output signals from the electric filters to be provided to the controller.

However, Watanabe teaches two electric filter for respectively extracting an electric signal component a fixed frequency width apart around a peak frequency determined by sweeping an electric signal outputted from the photo diode (see figure 5 element photo detector 48, electrical filter element BPF 50-1 to 50-K; column 6 lines 10-16), and a power-meter for determining power of output signals from the electric filters to be provided to the controller (it should be noted, figure 18 represents the B relay station of figure 5, and further figure 18 shows a feedback loop, the photo detector converted the optical signal from the signal light into an electric signal and sends the signal to element 134 which represents an electric filter, and sends the signal to power-meter 135 for calculation and provides an optical output to polarization control circuit 137 which the examiner interprets as the controller).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Gain Shape Compensation of Zarris by incorporating two electric filters for respectively extracting an electric signal component a fixed frequency width apart around a peak frequency determined by sweeping an electric signal outputted from the photo diode, and two wattmeters for determining powers of output signals from the electric filters to be provided to the controller in order to detect the optical signal and thereby convert the signal into an electrical signal, and , further separate the electric signal by a bandpass filter in order to provide an electric output power by a demodulator.

The motivation for this modification in Zarris is to provide an optical communication system, which permits SCM optical communication by coherent optical transmission to be implemented at lower cost as taught by Watanabe (see Watanabe column 3 lines 20-23).

17. Claims 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zarris et al (Pub.No.: US 2002/0135842) in view of Uda et al (US 7,116,908).

18. With respect to claims 10 and 11, all the limitations of these claims have been discussed in claim 1 above. Zarris fails to teach the compensator comprises a variable pass characteristic compensator.

However, Uda teaches an amplifier comprises a variable pass characteristic compensator (see figure 16 A which the examiner interprets as a pass characteristic compensator).

Therefore, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains to have modified the Gain Shape Compensation of Zarris by incorporating a pass characteristic compensator.

The motivation for this modification in Zarris is to monitor a probe optical strength level of one of the ranges of the amplifier wave signal as taught by Uda (see Uda column 3 line 1-19).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ralph Jean-Bart whose telephone number is (571)270-

1017. The examiner can normally be reached on Mon-Thurs 7:30-5:00PM; Fri 7:30-4:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on (571)272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RJB
Ralph Jean-Bart

11/09/2006

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER